<u>Amendments to the Specification</u>:

Please replace paragraphs [0016] and [0017] as follows:

~~**[0016]** By inverting the procedure of conventional approaches, the authors propose a methodology based on the successive application of two stages. The first stage focuses on calibration allowing evaluation of the modification to be applied to the effective permeabilities of the streamlines in order to improve calibration. The second stage relates to the transfer of the effective permeability variation of the streamlines to the realization. This process is continued until a satisfactory calibration is obtained. The main limit of this approach is that it does not preserve the coherence of the realization in relation to the stochastic model.~~

<u>SUMMARY OF THE INVENTION</u>

~~[0017]~~<u>[0016]</u> The method according to the invention allows working out numerical models, representing heterogeneous underground media such as oil reservoirs or aquifers, in accordance with a set of dynamic data measured in production, injection or observation wells, and with a stochastic model characterizing the spatial distribution of the heterogeneities.

<u>**[0017]** By inverting the procedure of conventional approaches, the inventors provide a methodology based on the successive application of two stages. The first stage focuses on calibration allowing evaluation of the modification to be applied to the effective permeabilities of the streamlines in order to improve calibration. The second stage relates to the transfer of the effective permeability variation of the streamlines to the realization. This process is continued until a satisfactory calibration is obtained. The main limit of this approach is that it does not preserve the coherence of the realization in relation to the stochastic model.</u>

Please replace paragraph [0035] as follows:

[0035] K_i^{eff} is the effective permeability of the i-th group of streamlines. N_{gSL} is the number of streamlines contained in this i-th group~~,~~; N_k is the number of grid cells traversed by the k-th streamline of the i-th group~~,~~; $q_{k,j}$ is the flow for the k-th streamline at the level of the j-th grid cell~~,~~; $\Delta\tau_{k,j}$ is the flight time for the k-th streamline through the j-th grid cell.

Please replace paragraph [0055] as follows:

[0055] The procedure described here focuses on the case of streamline flow simulations. Streamlines actually appear to be a very natural tool for defining zones. From the present invention involving identification of zones and calculation of the effective permeabilities for these zones, this choice seems to be logical. Other types of application can however be considered. For example, the information relative to the various zones could be provided by well tests. The effective permeability can in this case be calculated as a function of the radius of investigation around the well ; the zones considered are then rings. The flow simulator used for well test simulation can be a standard flow simulator. The procedure to be followed is similar to the procedure described for the streamlines. Flow simulation allows identification of zones and determination of the effective permeability for these zones, which can be compared with the data measured in the field. Then, minimization of an intermediate objective function according to the approach described above allows propagation of the correction to be applied to the effective permeabilities to the absolute permeabilities of the grid cells in the zones while respecting the a priori spatial variability model.